

Aside from its participation in experiment development functions, the NGO may be considered at the same time an agent of the user in dealing with NASA regarding accommodations, schedules, and (launch) delivery aspects of the enterprise. In this capacity, the question of indemnification from consequential and collateral damage arises in the handling of the experiment. Terms of agreement with the user, similar to that invoked by commercial suppliers of products, will be needed to waive liability. On the other hand, if the NGO's objective were to "promote" commercial use of the ISS, it would be better served to be able to extend 2<sup>nd</sup> party liability regarding the services it offers to the user as an agent. In this case, the user would have redress to cover business losses or reduce risk in the planning of a commercial enterprise against denied access to the ISS. Currently, such assurance is not provided except through queuing and bumping provisions stipulated in user agreements regarding the Shuttle.

#### **4.1.5.3. Summary**

The nature of the NGO implementation is somewhat different from the majority of the cases addressed by liability legislation since this legislation deals with commercial entities interacting with NASA while the NGO is more the privatization of a traditional NASA function. It will therefore require special legislative considerations and new agreement provisions with users.

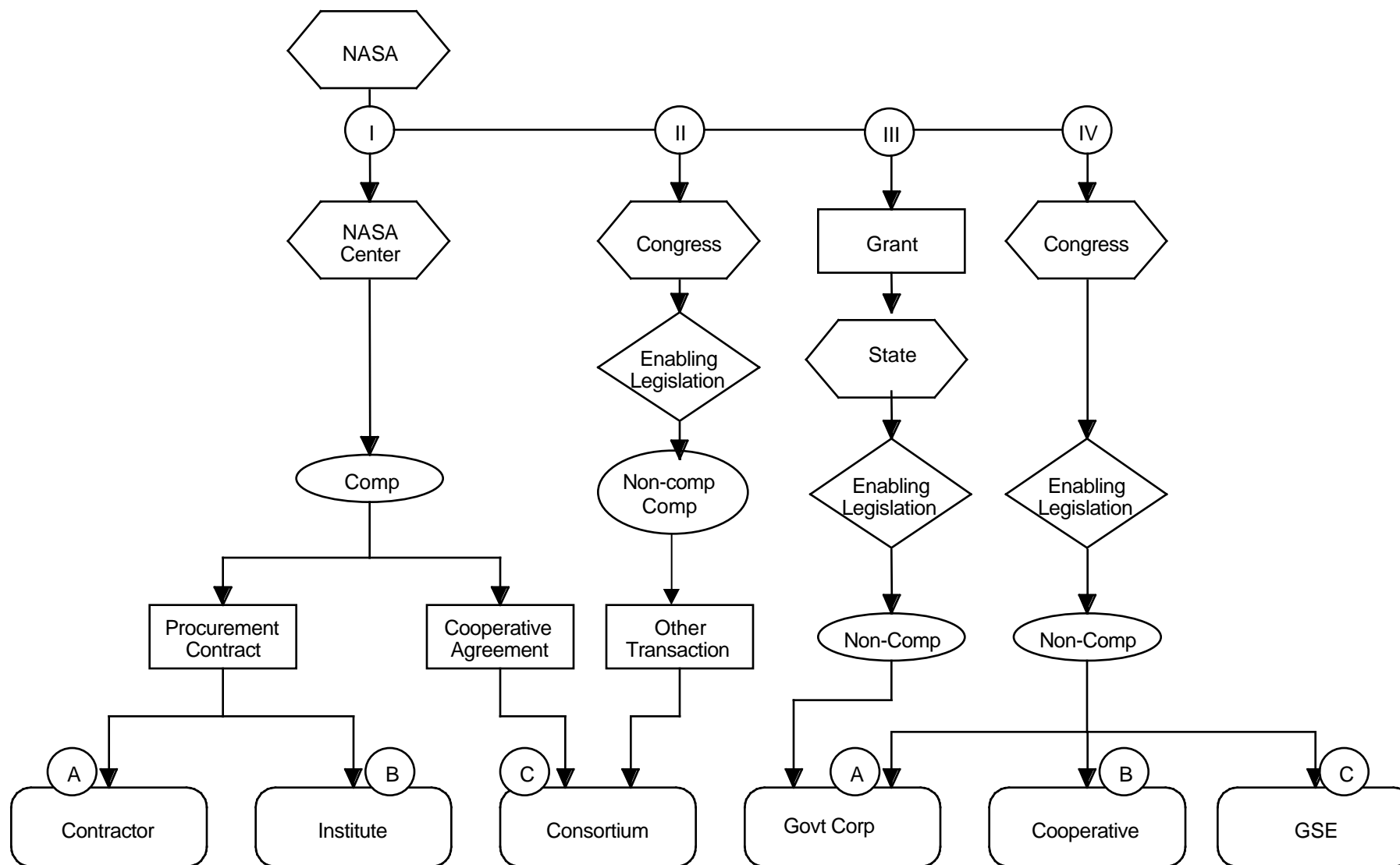
## **5. ANALYSIS**

### **5.1. Implementation Paths**

Figure 5-1 summarizes the principal NGO implementation strategies discussed in this study. They are characterized by a) the process or path for establishing the NGO and b) the final form or type of NGO. The paths may involve competitive (Comp) or non-competitive (Non-Comp) acquisition processes. The latter usually involves, additionally, the need for enabling legislation by the Federal or a State government. The three principal contractual instruments, which define the relationship between NASA and the NGO and establish the NGO's responsibilities, are: procurement contracts, cooperative agreement, and Other Transactions. Presumably the NGO, regardless of type, would then use conventional procurement instruments to acquire support services and specialized skills. Under certain state statutes, services could be offered as payment for stocks in the NGO enterprise. These NGO contractual activities will not be discussed here but could cover operations personnel, software maintenance, logistics support, engineering analysis, integration and test specialists, etc. The path labeled IA represents the standard NASA procurement approach and is not discussed below; the more flexible quasi-GO approach involving either a procurement contract or a cooperative agreement to form a NASA institute is shown as path IB. It should be noted that only a minor difference exists between the paths designated as IC and II since, in both cases, a form of an OT is used. The main distinction is that by using the enabling legislation to establish the NGO, its charter can be tailored to

meet the international prerequisites as well as empowering it to eventual full privatization status with minimal regulatory constraints. In effect, the legislation would prescribe the conditions and manner by which privatization would occur.

The more obvious strengths (S) and weaknesses (W) for each path and NGO option, based on the materials in this study, are discussed below. The path involving NASA using an OT to form a partnership with a consortium was not included because, at the present time, statutes limit the use of this instrument to research or prototyping. Its application to facilitating research is therefore covered as Path II presuming that new legislation will be required for it to be valid. The Path IA is not discussed since that represent the traditional approach for NASA to obtain support for its own purposes.



**Figure 5-1 Implementation Strategies**

### 5.1.1. Strengths and Weaknesses

**Path IB: The responsibility for facilitating ISS utilization is transferred to a special “Institute”, which is established through a competitive procurement.**

S Highly appropriate for facilitating research with ISS  
S Well understood with precedents  
S Cross-waiver for liability applies  
S Flexible personnel management

W Limited flexibility for acquiring independent funding  
W Subject to government regulations, particularly FAR  
W Strong NASA oversight and control  
W Not consistent with commercial utilization of ISS

**Path IC: NASA teams with a contractor or consortium, competitively selected, using a Cooperative Agreement**

S Substantial contribution of resources by partners  
S Consortium members bring wide range of technical skills and resources  
S Cross waiver of liability is provided  
S Does not require complicated Congressional approval process  
S Well established, familiar implementation procedure  
S Award cannot be protested to GAO like procurement contracts

W Competitive procurements preferred  
W No profit permitted thus limiting self financing  
W Questionable appropriateness for conducting operations, I&T  
W Functional applicability only if in direct support of R&D  
W Less freedom regarding patent rights  
W More Federal regulations are imposed

**Path II: A contractor or consortium is chartered by Congress through a form of an Other Transaction**

S Avoids most regulations including FAR  
S Only government-wide rules apply  
S Has flexibility regarding intellectual property rights  
S Less restrictive financial management procedures permitted  
S Consortium members bring wide range of technical skills and resources  
S Cost sharing reduces overall cost to government  
S Allows NASA participation as team member  
S Profit permitted  
S Use of commercial business practices permits streamlining

W No precedent for Congressional action  
W Cultural resistance, particularly from upper management, can be expected  
W Requires significant amount of "trust" in lieu of controls

- W Diminishes NASA management involvement
- W Questionable if contracts or grant could not be used
- W Although applicable for innovative work, questionable appropriateness for routing ops, I&T
- W Legal validity is always a question
- W Requires Congressional legislative definition, particularly if R&D is not the only purpose

**Path III: Granting a state the authority to create a Government Corporation to run the space station.**

- S States can provide internal resources with less wrangling
- S Freed from government employment rules, FOIA problems, FAR provisions
- S Liability can be assumed by state
- S State procurement mechanisms are no more restrictive than federal entities
  
- W Profit or loss becomes state residents (or stockholders) property, making it a political issue.
- W Best facilitates and experience are not necessarily state property
- W R&D and intellectual property are not usual domain of states

**Path IVA: Congressional approval for a new Government Sponsored Enterprise**

- S Can serve the purely business-like objectives with efficiency
- S Independence from NASA
- S Federal legislation can obviate most of the typical hurdles to efficiently doing business.
  
- W Requires strong business objectives and profit goals
- W Businesslike/Commercial nature of many of these enterprises may not be the most conducive to R&D (or other objectives) profit motive may not be appropriate.
- W GSE's are usually financial in nature

**Path IVB: Congress franchises a new Cooperative**

- S Can serve the multiple purposes of Technology Transfer, Research and Development, and service to scientific community without undue bureaucracy
- S Membership can set objectives without government scrutiny
- S Privatization endeavor is best taken away from under government oversight
- S Independence from NASA
  
- W Commercial viability of enterprise is less certain; often consists of less working capital
- W Membership rule is more complex and decision making often less swift
- W Special provisions required for non-signatory user access to ISS.

#### Path IVC: Congress establishes a dedicated Government Corporation

- S Clear charter to accomplish objectives is best obtained via federal legislation
- S Can serve the multiple purposes of Technology Transfer, Research and Development, and service to scientific community without undue bureaucracy
- S Privatization endeavor is best taken away from under government oversight
- S Independence from NASA
  
- W Requires heavy lobbying efforts
- W Businesslike/Commercial nature of many of these enterprises may not be the most conducive to R&D (or other objectives) profit motive may not be appropriate.
- W Must turn a profit and have clear paths to profit making

### 5.2. Management Metrics

If order to rank the various approaches, it is useful to have an objective set of metrics. The following management metrics have been derived from a basic consideration of the operation of an NGO and are an expansion on the three objectives for using an NGO introduced in Section 2.2. These may be necessary considerations but by no means sufficient.

**Table 5-1: Management Metrics**

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Staff Expertise	Ability to change workforce nature and character to accommodate changing task load
	Pay scale and benefit flexibility to acquire required talent and experience
Intellectual Property Rights	Control of proprietary or experimental information and plans
	Rights of ownership to products or results
Situational Flexibility	Responsivity to unanticipated requirements
	Degree of externally imposed procedures or processes for procurement
Growth Potential	Ability to refocus organization to accomplish changing or new tasks
	Charter constraints against new endeavors
Funding Constraints	Charter constraints against obtaining new revenue sources
	Ability to expand or contract budgets to meet needs
Motivation	Capability of re-investing based on utilization returns
	Motivation for reducing cost rather than maintaining status quo
Overhead Control	Ability to divest or tailor support resources or facilities to minimize costs
	Control of non-ISS related, unfunded activities or work within the organization
	Number of external interfaces involved to accomplish ISS utilization
Assurance	Ability to guarantee schedules and support
	Capability of indemnifying user losses

### 5.3. Observations

Although the purpose of this study is to provide factual basis for selecting the option and implementation path for the NGO, and not to make a specific recommendation, two examples are selected from the literature review as reasonable paradigms for the NGO purposes. They are the Florida Spaceport Authority and INTELSAT. The former provides user services in a reduced cost environment for a national customer base. Although partially subsidized by the State, it expects to charge user fees for payload-launcher integration, and launch services. It operates “outside the gate”<sup>19</sup> with reduced procurement and regulatory requirements for the user. It should be noted, however, that the Air Force has donated two launch pads for its use without imposing the usual safety regulations or prioritization constraints thereby further reducing the expected cost to user for launching their payloads. The NGO, if NASA continues to operate the ISS, would still be encumbered by the constraints and regulations associated with using NASA property. From an international perspective, INTELSAT is noteworthy because it deals with the utilization of resources jointly held by the international community and involves an international “customer” base both situations exactly apply to ISS utilization. Efficient utilization of the ISS requires streamlining management – the focus of this trade study. But further cost reductions can be accomplished by first reducing the complexity associated with the operations (including planning, scheduling, integration testing, etc.), i.e., streamlining the functionality provided by the NGO and secondly, minimizing the number of interfaces which must be maintained and controlled including interfacing separate national management organizations. A centralized management entity, such as an INTELSAT-like corporation comprised of member countries that have contributed resources to the ISS, is one way to accomplish this efficiency. This centralized approach presumes that individual member contributions become held jointly by the corporation for use by any selected user from any member state or elsewhere from a resource pool allocated for non-member use.

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<sup>19</sup> FSA is planning to build a facility at KSC for instrument integration in support of the ISS.